

Trend Study 16C-30-99

Study site name: Upper Hole Trail.

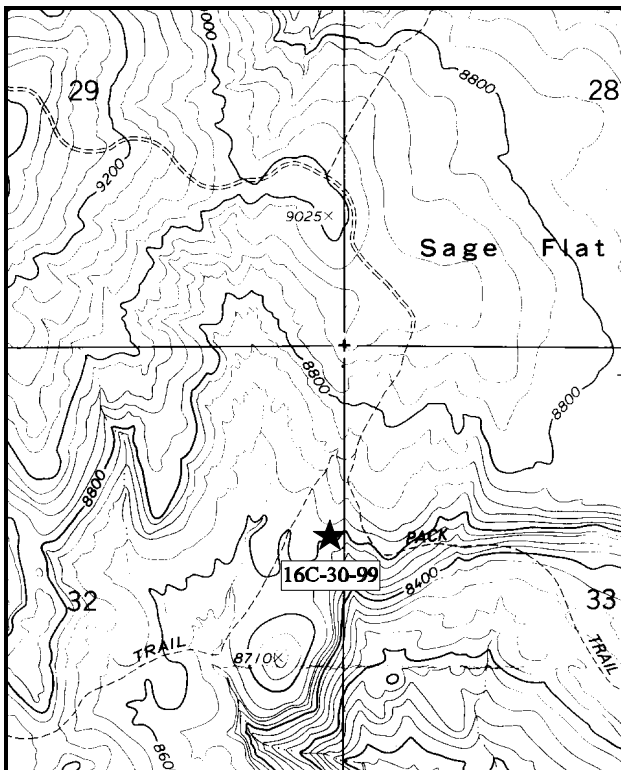
Range type: Mixed Mountain Brush.

Compass bearing: frequency baseline 181°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

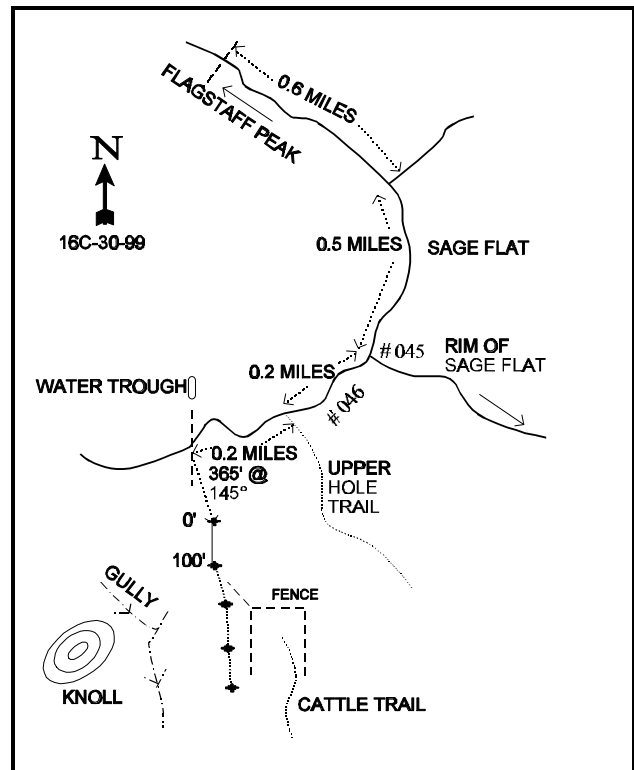
LOCATION DESCRIPTION

From Wrigley Springs Reservoir, continue SE 3.0 miles to the T-intersection by Flagstaff Peak. Turn left towards Sage Flat. Go 1.65 miles and cross a cattleguard. Continue straight 0.9 miles to a fence and cattleguard by a pond. Continue SE 1.0 miles to the Sage Flat seeding. Go 0.6 miles to a fork. Continue straight on the main road about 0.5 miles to a fork. At this point, a road that runs along the rim of Sage Flat takes off to the left (#045). Turn right at 0.35 miles on F.S. Road #046. Continue south 0.2 miles to the Hole Trail. Go another 0.2 miles on the main road to an old fence line by an unused water trough. The study starts about 100 yards south of the road. The first baseline stake, a 2' green fencepost with browse tag #9020 attached, is along an old fence line.



Map Name: Flagstaff Peak,

Township 20S, Range 6E, Section 32



Diagrammatic Sketch

UTM 4320734.339 N, 477350.307 E

DISCUSSION

Trend Study No. 16C-30 (31-28)

The Upper Hole Trail trend study is located near Sage Flat. The area around Sage Flat and South Sage Flat on the southeast side of Ferron Mountain is listed as important elk winter range although there was little elk sign encountered in 1994, but sign increased substantially in 1999. It is an open sagebrush community with scattered mountain brush, mostly on the slopes. The study itself is located in a low saddle between the large sagebrush flats, in a mixed mountain brush type near the edge of the cliffs where the Upper Hole Trail climbs up from the pinyon-juniper country below. At the study site, slope is 12% with a southern exposure. The elevation is 8,600 feet. This Forest Service land is in the Ferron allotment and is grazed by cattle in the summer from June 21 to October 5. Pellet group data from 1999 estimate 5 deer, 32 elk and 31 cow days use/acre (12 ddu/ha, 79 edu/ha, and 77 cdu/ha). Rabbit pellet groups are very numerous. Most of the elk pellet groups are from last winter, but some are from this spring ('99). About 40% of the cattle pats are from this season, while the rest are from last season. Cattle were in the area during the 1999 reading.

The soil has a clay loam texture with a neutral pH (7.3). The soil depth is moderately deep with an effective rooting depth estimated at almost 16 inches. Phosphorus and potassium are limited at just 2.6 ppm and 54.4 ppm respectively. Values less than 10 ppm for phosphorus and 70 ppm for potassium have been shown to limit normal plant growth and development. There is some rock on the surface and within the profile and there is a compacted layer at about 10 to 12 inches in depth. Although there is substantial soil movement and gullyng on surrounding areas, especially on cattle and game trails, vegetative cover is generally adequate to prevent serious erosion on the study site.

The mountain brush slope is extremely diverse with 17 browse species encountered. The dominant species on the site include Utah serviceberry, antelope bitterbrush, mountain big sagebrush, and curleaf mountain mahogany. Wood's rose and snowberry are also common. Serviceberry had a population density of 4,799 plants/acre in 1988. Nearly all (98.6%) of these shrubs were classified as young plants. Seedlings were also abundant. This artificially inflated population returned to a more sustainable level by 1994 when 1,180 mostly mature plants were estimated. Mature plants averaged two and one-half feet in height with a crown diameter of almost three feet. Utilization was mostly light with a few individuals displaying moderate to heavy use. By 1999, the population has declined to 680 plants/acre. Use is mostly moderate to heavy, vigor normal, and percent decadence low at only 12%. Some of the differences in density between years may be partly due to the larger sample used in 1994 and 1999, and counting stems instead of whole plants.

Antelope bitterbrush had a density of 2,720 mostly mature plants/acre in 1994. Utilization is light to moderate, vigor is good and there were few decadent individuals. The mature shrubs averaged about 1 foot in height with a three foot crown. There were few young and no seedlings reported in 1988 or 1994. In 1999, density was estimated at 1,980 plants/acre, 75% of which are represented by low, prostrate mature plants. Utilization is moderate to heavy with nearly half of the population showing heavy use with a clubbed growth form. Young plants are common, vigor is good and decadent plants are rare. Some of the difference in density between 1994 estimates and 1999 counts may be caused by the difficulty in counting this large, prostrate shrub. In some instances, it is hard to tell where one plant stops and another starts.

Mountain big sagebrush appears to have a stable population of about 2,200 plants/acre that are mostly lightly hedged. Recruitment is adequate and percent decadency is fairly low at 23% in 1994 and only 10% in 1999. Black sagebrush has increased in density from 300 plants/acre in 1994 to 1,280 by 1999. This site appears to be a marginal one for mountain big sagebrush. Poor vigor was common in 1988 for both species and several mountain big sagebrush plants sampled in 1999 were chlorotic. Recall the very low amounts of phosphorus in the soil. The compaction layer found in the soil profile at 10 to 12 inches in depth may be a partial rooting barrier for mountain big sagebrush.

Curleaf mountain mahogany made up 25% of the shrub cover in 1994 and 28% in 1999. There is currently an estimated 800 plants/acre with a good mix of tall partly available mature plants and shorter all available mature and young plants. Utilization has been light in the past, but current use is moderate to heavy. There is also a small population of heavily hedged true mountain mahogany. This along with rabbitbrush, Wood's rose, and snowberry provide some additional browse forage. A few scattered pinyon and limber pine are also found on the site.

Diversity is also high in the herbaceous component of the community. Eleven species of grass were identified in 1994 and 1999. Although combined all together they only provided 8% cover in 1994 and 7% in 1999. Of those, Salina wildrye is the most abundant. It accounted for 61% of the grass cover in 1994 and 43% in 1999. Diversity of forbs is excellent with 31 different species found in 1994 and 28 in 1999. Many are valuable forage species. Indian paintbrush, penstemon, redroot and sulfur eriogonum, and Oregon fleabane are most often utilized. Two low value forbs, rock goldenrod and desert phlox, provide nearly half of the forb cover.

1994 TREND ASSESSMENT

Bare ground and litter cover have both decreased. At this time vegetative cover offers as much protection to the soil as does the litter. Most of the vegetative cover (58%) comes from browse, but there is also an abundant herbaceous component which has increased in nested frequency since 1988. Soil trend is slightly up. Most preferred browse species appear to have stable mature populations, although mountain big sagebrush and black sagebrush have increased decadency rates. Several additional species were picked up in the shrub density strips due to the lengthening of the baseline in 1994. This new larger sample gives a better, more representative sample of the area. The browse trend is stable. Grasses are shifting toward more native and palatable species for both livestock and big game. Sum nested frequency of grasses increased slightly since 1988. There was a large increase in summed nested frequency for forbs, most of which offer moderate ground cover. The herbaceous understory trend is slightly up.

TREND ASSESSMENT

soil - slightly up

browse - stable

herbaceous understory - slightly up

1999 TREND ASSESSMENT

Trend for soil is up slightly. Percent cover of bare ground has declined and litter cover has increased. Vegetation cover has also increased but the improvement comes entirely from shrub cover which is less effective at protecting the soil. Rock and pavement cover have doubled since 1994 which may indicate some soil loss. Trend for the key browse species, serviceberry, mountain big sagebrush and curleaf mountain mahogany, are considered stable. Utilization is moderate to heavy on serviceberry and curleaf, but vigor remains good and percent decadence low. Mountain big sagebrush shows mostly light use. Vigor has improved and percent decadence has declined from 23% to 10%. Trend for the herbaceous is stable. Sum of nested frequency for perennial grasses and forbs have declined slightly but the dominant species, Salina wildrye, rock goldenrod, and desert phlox which provide 53% of the herbaceous cover, have remained stable.

TREND ASSESSMENT

soil - up slightly

browse - stable

herbaceous understory - stable

HERBACEOUS TRENDS --
Herd unit 16C, Study no: 30

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'94	'99	'88	'94	'99	'94	'99
G	Agropyron cristatum	-	1	4	-	1	2	.03	.03
G	Agropyron trachycaulum	32	52	41	14	19	19	1.06	.26
G	Aristida purpurea	-	-	1	-	-	1	-	.00
G	Bouteloua gracilis	-	1	-	-	1	-	.00	-
G	Carex spp.	_a 6	_b 35	_a 16	2	14	7	.41	.37
G	Elymus salina	_b 251	_a 173	_a 169	87	69	68	5.05	4.10
G	Koeleria cristata	10	5	1	3	2	1	.06	.00
G	Oryzopsis hymenoides	10	12	10	4	5	4	.10	.09
G	Poa fendleriana	_a 63	_b 85	_{ab} 76	29	37	30	1.14	1.08
G	Sitanion hystrix	1	7	3	1	3	1	.04	.00
G	Stipa comata	7	8	2	5	3	1	.04	.00
G	Stipa lettermani	_a -	_b 31	_c 66	-	12	23	.57	1.25
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		380	410	389	145	166	157	8.53	7.24
Total for Grasses		380	410	389	145	166	157	8.53	7.24
F	Antennaria microphylla	-	-	3	-	-	2	-	.03
F	Arenaria fendleri	_a -	_{ab} 5	_b 9	-	2	4	.03	.24
F	Astragalus convallarius	2	13	1	1	5	1	.11	.01
F	Astragalus coltoni	_a -	_b 24	_a -	-	11	-	.37	-
F	Astragalus miser	_a -	_b 7	_a -	-	5	-	.15	-
F	Aster spp.	-	-	4	-	-	2	-	.01
F	Astragalus spp.	_a 10	_{ab} 19	_b 33	5	8	17	.16	.99
F	Caulanthus crassicaulis	3	-	-	2	-	-	-	-
F	Castilleja linariaefolia	_b 62	_{ab} 29	_a 28	29	14	15	.19	.22
F	Calochortus nuttallii	-	3	-	-	1	-	.00	-
F	Chaenactis douglasii	_b 23	_a 1	_{ab} 19	12	1	8	.00	.06
F	Cirsium spp.	1	6	8	1	4	4	.04	.10
F	Crepis acuminata	13	6	4	7	3	3	.01	.01
F	Cryptantha spp.	1	-	-	1	-	-	-	-
F	Cymopterus spp.	2	2	-	1	2	-	.01	-
F	Erigeron eatonii	40	48	35	21	22	17	.33	.18
F	Erigeron flagellaris	-	-	3	-	-	1	-	.00
F	Erigeron spp.	_a -	_a -	_b 9	-	-	4	-	.04
F	Erigeron pumilus	8	8	4	3	4	1	.02	.15
F	Eriogonum racemosum	-	42	36	-	19	17	.27	.26
F	Erigeron speciosus	_b 16	_c 29	_a -	6	12	-	.33	-
F	Eriogonum umbellatum	_a -	_b 9	_b 14	-	5	6	.22	.30
F	Hymenopappus filifolius	_b 10	_a -	_a 2	7	-	1	-	.03

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'94	'99	'88	'94	'99	'94	'99
F	Hymenoxys richardsonii	28	25	17	15	12	9	.08	.14
F	Lesquerella spp.	7	18	20	6	10	9	.05	.09
F	Lithospermum incisum	-	5	-	-	2	-	.01	-
F	Linum lewisii	-	2	-	-	2	-	.01	-
F	Lupinus spp.	2	10	8	2	5	4	.08	.16
F	Machaeranthera canescens	_b 46	_{ab} 18	_a 11	20	11	5	.10	.10
F	Machaeranthera grindelioides	_b 37	_a 11	_a 8	16	6	4	.08	.07
F	Oxytropis lambertii	_b 22	_a 1	_a -	11	1	-	.00	-
F	Penstemon carnosus	34	39	33	18	16	18	.18	.68
F	Penstemon spp.	33	39	35	14	20	16	1.21	.81
F	Petradoria pumila	_a 19	_b 63	_b 56	11	24	24	2.26	2.49
F	Phlox austromontana	_a -	_b 71	_b 71	-	26	27	1.92	2.25
F	Polygonum douglasii (a)	-	11	6	-	4	2	.02	.01
F	Senecio multilobatus	_a 3	_{ab} 5	_b 14	1	3	8	.01	.07
F	Taraxacum officinale	4	-	3	2	-	2	-	.01
Total for Annual Forbs		0	11	6	0	4	2	0.01	0.00
Total for Perennial Forbs		426	558	488	212	256	229	8.32	9.57
Total for Forbs		426	569	494	212	260	231	8.35	9.59

Values with different subscript letters are significantly different at $\alpha = 0.10$ (annuals excluded)

BROWSE TRENDS --

Herd unit 16C, Study no: 30

Type	Species	Strip Frequency		Average Cover %	
		'04	'09	'04	'09
B	Amelanchier utahensis	29	23	3.10	2.87
B	Artemisia nova	7	21	.42	.91
B	Artemisia tridentata vaseyana	66	50	2.99	5.00
B	Cercocarpus ledifolius	24	26	5.79	7.88
B	Cercocarpus montanus	5	5	.00	.21
B	Chrysothamnus depressus	19	17	.28	.37
B	Chrysothamnus viscidiflorus	21	19	.69	.45
B	Eriogonum corymbosum	3	2	.15	.03
B	Gutierrezia sarothrae	14	12	.21	.10
B	Juniperus osteosperma	-	-	.15	-
B	Leptodactylon pungens	8	8	.15	.36
B	Pinus edulis	0	1	.15	-
B	Purshia tridentata	33	37	4.69	4.87
B	Rosa woodsii	13	13	.82	.96
B	Symphoricarpos oreophilus	36	41	3.26	4.06
B	Tetradymia canescens	1	1	.03	-
B	Yucca baileyi navajoa	7	7	.09	.16
Total for Browse		286	283	23.03	28.29

CANOPY COVER --

Herd unit 16C, Study no: 30

Species	Percent Cover '09
Amelanchier utahensis	3
Cercocarpus ledifolius	11
Pinus edulis	2

BASIC COVER --

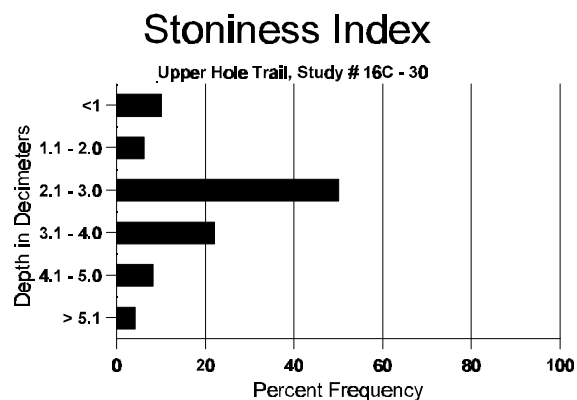
Herd unit 16C, Study no: 30

Cover Type	Nested Frequency		Average Cover %		
	'04	'09	'88	'94	'99
Vegetation	316	315	13.25	38.02	42.09
Rock	128	109	.50	3.47	5.51
Pavement	94	135	0	.59	2.87
Litter	380	383	55.50	38.12	52.62
Cryptogams	1	3	.25	.03	.03
Bare Ground	281	244	30.50	26.51	21.57

SOIL ANALYSIS DATA --

Herd Unit 16C, Study # 30, Study Name: Upper Hole Trail

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
15.1	54.0 (14.4)	7.3	44.0	22.2	33.8	2.6	2.6	54.4	0.6



PELLET GROUP DATA --

Herd unit 16C, Study no: 30

Type	Quadrat Frequency		Pellet Transect Days Use/Acre (ha)
	04	09	09
Rabbit	15	48	n/a
Elk	3	14	32 (79)
Deer	3	3	5 (12)
Cattle	5	8	31 (77)

BROWSE CHARACTERISTICS --

Herd unit 16C, Study no: 30

A Y G R E		Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier utahensis																		
S	88	19	1	-	-	-	-	-	-	-	20	-	-	-	1333		20	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	3	-	-	3	-	-	-	-	-	6	-	-	-	120		6	
Y	88	67	4	-	-	-	-	-	-	-	71	-	-	-	4733		71	
	94	8	-	-	4	-	-	1	-	-	13	-	-	-	260		13	
	99	4	5	3	2	-	1	-	-	-	15	-	-	-	300		15	
M	88	-	1	-	-	-	-	-	-	-	1	-	-	-	66	27	12	
	94	36	4	1	4	-	-	-	-	-	45	-	-	-	900	29	31	
	99	-	9	1	1	1	1	2	-	-	15	-	-	-	300	80	81	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	99	-	2	2	-	-	-	-	-	-	2	-	-	2	80		4	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		07%			00%			00%			-75%							
'94		08%			02%			00%			-42%							
'99		50%			24%			06%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	4799	Dec:	0%			
												'94	1180		2%			
												'99	680		12%			
Artemisia nova																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	7	-	-	-	-	-	-	-	-	6	-	1	-	140		7	
Y	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	14	-	-	-	-	-	-	-	-	14	-	-	-	280		14	
M	88	2	-	-	-	-	-	-	-	-	1	-	1	-	133	7	8	
	94	9	-	-	-	-	-	-	-	-	9	-	-	-	180	11	19	
	99	26	14	1	-	-	-	-	-	-	38	-	3	-	820	8	15	
D	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	94	6	-	-	-	-	-	-	-	-	1	-	-	5	120		6	
	99	9	-	-	-	-	-	-	-	-	5	-	-	4	180		9	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	140		7	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			25%			+12%							
'94		00%			00%			33%			+77%							
'99		22%			02%			11%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	265	Dec:	25%			
												'94	300		40%			
												'99	1280		14%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	88	11	-	-	-	-	-	1	-	-	12	-	-	-	800			12
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	47	1	-	-	-	-	1	-	-	48	1	-	-	980			49
Y	88	12	-	-	1	-	-	-	-	-	12	-	1	-	866			13
	94	16	1	-	4	-	-	-	-	-	21	-	-	-	420			21
	99	30	3	-	-	-	-	-	-	-	32	-	1	-	660			33
M	88	10	3	1	-	-	-	-	-	-	6	-	8	-	933	20	21	14
	94	62	5	-	2	-	-	3	-	-	72	-	-	-	1440	17	21	72
	99	57	7	-	2	-	-	-	-	-	64	-	2	-	1320	19	27	66
D	88	4	-	-	-	-	-	1	-	-	2	-	3	-	333			5
	94	25	2	-	1	-	-	-	-	-	11	-	-	17	560			28
	99	11	-	-	-	-	-	-	-	-	8	-	2	1	220			11
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	260			13
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	240			12
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		09%			03%			38%			+12%							
'94		07%			00%			14%			- 9%							
'99		09%			00%			05%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	2132	Dec:		16%		
												'94	2420			23%		
												'99	2200			10%		
Cercocarpus ledifolius																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	-	-	2	-	-	-	-	-	4	-	-	-	80			4
	99	-	3	1	1	-	-	-	-	-	5	-	-	-	100			5
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	29	1	2	-	-	-	-	-	-	32	-	-	-	640	46	47	32
	99	14	7	2	-	1	7	1	-	-	32	-	-	-	640	68	57	32
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	2	1	-	-	-	-	-	-	3	-	-	-	60			3
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'94		03%			06%			00%			+10%							
'99		33%			28%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:		0%		
												'94	720			0%		
												'99	800			8%		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	3	-	-	3	-	-	-	60		3	
	99	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	94	-	8	-	-	-	-	1	-	-	9	-	-	-	180	25	9	
	99	2	-	6	-	-	2	-	-	-	10	-	-	-	200	20	10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'94		67%			00%			00%			- 8%							
'99		09%			73%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'94	240		-			
												'99	220		-			
Chrysothamnus depressus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	94	36	9	-	-	-	-	1	-	-	46	-	-	-	920	6	46	
	99	8	10	2	-	-	1	-	-	-	21	-	-	-	420	3	21	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	4	-	-	-	-	-	-	-	-	3	-	-	1	80		4	
	99	-	5	3	-	-	-	-	-	-	7	-	-	1	160		8	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'94		18%			00%			02%			-34%							
'99		45%			18%			03%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	0%			
												'94	1000		8%			
												'99	660		24%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus																		
Y	88	3	1	1	-	-	-	-	-	-	4	-	1	-	333		5	
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	3	-	-	-	-	-	7	-	-	2	-	8	-	666	2	4	10
	94	23	2	-	10	-	-	-	-	-	35	-	-	-	700	6	10	35
	99	6	13	1	2	-	-	-	-	-	19	-	3	-	440	12	13	22
D	88	-	-	-	1	-	-	-	-	-	1	-	-	-	66			1
	94	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
	99	1	2	1	-	-	-	-	-	1	3	-	-	2	100			5
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		06%			06%			56%			-27%							
'94		05%			00%			00%			-28%							
'99		54%			11%			18%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	1065	Dec:	6%			
												'94	780		5%			
												'99	560		18%			
Eriogonum corymbosum																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	2	1	-	4	-	-	-	-	-	7	-	-	-	140	9	15	7
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40	7	18	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'94		14%			00%			00%			-71%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'94	140		-			
												'99	40		-			
Gutierrezia sarothrae																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	6	2	1
	94	20	-	-	2	-	-	-	-	-	22	-	-	-	440	6	6	22
	99	27	-	-	-	-	-	-	-	-	27	-	-	-	540	6	6	27
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+86%							
'94		00%			00%			00%			+29%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	66	Dec:	-			
												'94	480		-			
												'99	680		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Leptodactylon pungens																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	1	-	-	-	-	-	-	-	-	-	1	-	-	20		1	
	99	2	-	-	-	-	-	-	-	-	-	2	-	-	40		2	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	94	29	-	-	-	-	-	-	-	-	-	29	-	-	580	13	29	
	99	36	-	-	-	-	-	-	-	-	-	36	-	-	720	6	36	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	2	-	-	-	-	-	-	-	-	-	2	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'94		00%			00%			00%			+25%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	0%			
												'94	600		0%			
												'99	800		5%			
Pinus edulis																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	1	-	-	-	-	-	-	-	-	-	1	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'94		00%			00%			00%										
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'94	0		-			
												'99	20		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
Y	88	8	1	-	-	-	-	-	-	-	9	-	-	-	600		9	
	94	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
	99	2	12	6	1	-	-	1	-	-	22	-	-	-	440		22	
M	88	-	6	-	1	-	-	-	-	-	7	-	-	-	466	12	39	
	94	101	23	1	2	-	-	-	-	-	123	4	-	-	2540	11	36	
	99	1	22	19	-	10	22	-	-	-	74	-	-	-	1480	16	38	
D	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	94	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	99	2	-	-	1	-	-	-	-	-	1	-	-	2	60		3	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	80		4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		41%			00%			00%			+58%							
'94		18%			.73%			00%			-27%							
'99		44%			47%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	1132	Dec:	6%			
												'94	2720		1%			
												'99	1980		3%			
Rosa woodsii																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	37	-	-	2	-	-	-	-	-	39	-	-	-	780		39	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	23	-	-	4	-	-	-	-	-	27	-	-	-	540		27	
	99	52	-	-	11	-	-	4	-	-	67	-	-	-	1340		67	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	94	62	-	-	64	-	-	-	-	-	126	-	-	-	2520	8	5	
	99	21	-	-	12	-	-	4	-	-	37	-	-	-	740	17	10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'94		00%			00%			00%			-32%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'94	3060		-			
												'99	2080		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	88	11	-	-	-	-	-	-	-	-	11	-	-	-	733			11
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	4	-	-	-	-	-	3	-	-	7	-	-	-	140			7
Y	88	22	-	-	-	-	-	-	-	-	22	-	-	-	1466			22
	94	5	-	-	3	-	-	-	-	-	8	-	-	-	160			8
	99	10	3	-	11	-	-	2	-	-	26	-	-	-	520			26
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	64	43	1
	94	63	8	-	30	-	5	2	-	-	108	-	-	-	2160	12	24	108
	99	39	-	-	20	-	-	1	-	-	60	-	-	-	1200	17	27	60
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	1	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+35%							
'94		08%			04%			00%			-26%							
'99		05%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	1532	Dec:	0%			
												'94	2360		2%			
												'99	1740		1%			
Tetradymia canescens																		
Y	88	7	-	-	-	-	-	-	-	-	7	-	-	-	466			7
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200	5	6	3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	6	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			-94%							
'94		00%			00%			00%			-50%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	666	Dec:	-			
												'94	40		-			
												'99	20		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Yucca baileyi navajoa																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	11	-	-	-	-	-	-	-	-	-	11	-	-	220		11	
	99	9	-	-	-	-	-	-	-	-	-	9	-	-	180		9	
M	88	1	-	-	-	-	-	-	-	-	-	1	-	-	66	9 10	1	
	94	5	-	-	-	-	-	-	-	-	-	5	-	-	100	8 10	5	
	99	6	-	-	-	-	-	-	-	-	-	7	-	-	140	6 12	7	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+79%							
'94		00%			00%			00%			+ 0%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	66	Dec:	-			
												'94	320		-			
												'99	320		-			